

8. Michelle

Program Name: Michelle.java

Input File: michelle.dat

Michelle has always been interested in patterns. Mathematics has patterns, Computer Science has patterns as do many fields of study. She never really thought too much about languages like English beyond the obvious poetry but now wonders how she might look for other types of patterns. Obviously, there is looking at how frequently the various letters are used but she was thinking about word sizes.

Michelle asked your team for assistance in creating a program that has the flexibility to tweak the analysis as she decides what might be most interesting and revealing. Her basic idea is to build histograms for various ranges of word sizes. However, since prose can get very lengthy and wordy, Michelle recognizes that she will need to normalize the results by using percentages instead of raw counts. She cannot print histograms that are thousands of characters wide.

Can your team help Michelle with this project?

Input: First line of data file contains a positive integer T , the number of test cases that follow with $1 \leq T \leq 10$. Each test case starts with a single line of integers separated by single spaces with at least one and no more than 50 integers that define the upper-size limit on each of the size ranges to be used for the histogram. Each of the integers are in $[1,50]$ and are listed in strictly ascending order. All words with lengths greater than the last integer would be placed in a final interval with a maximum size of 50. Unless the data includes 1 as the upper bound of the first interval, all words with lengths smaller than the first integer are placed in the first interval. Following the line of integers will be one or more lines of non-zero length text eventually followed by a line containing a single '#' signaling the end of text for that test case. The count of total words will be (0,10000).

Output: For each test case, display a horizontal histogram like those shown in the sample output. Each line of output starts with the lower and upper sizes of that specific interval with leading 0s when < 10 , separated by a single colon. The line of output then continues with " -> " and the percentage of words placed in that bracket rounded to a whole number, left aligned in a column 5 positions wide. A single space and the histogram then follow on the same line where each 'x' represents 1% of the total number of words. Following each test case output a line containing 15 equal signs "=====".

~ Sample input and output on next page ~

Michelle, continued

Sample input:

```
3
1 4 7 12
We the People of the United States in Order to form a more perfect Union
establish Justice insure domestic Tranquility provide for the common defence
promote the general Welfare and secure the Blessings of Liberty to ourselves
and our Posterity do ordain and establish this Constitution for the
United States of America
#
5 9 12
We the People of the United States in Order to form a more perfect Union
establish Justice insure domestic Tranquility provide for the common defence
promote the general Welfare and secure the Blessings of Liberty to ourselves
and our Posterity do ordain and establish this Constitution for the
United States of America
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promote the general Welfare and secure the Blessings of Liberty to ourselves
and our Posterity do ordain and establish this Constitution for the
United States of America
#
3 5 7 9 11
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promote the general Welfare and secure the Blessings of Liberty to ourselves
and our Posterity do ordain and establish this Constitution for the
United States of America
#
```

Sample output:

```
Test case #1
01:01 -> 2      xx
02:04 -> 44     xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
05:07 -> 38     xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
08:12 -> 15     xxxxxxxxxxxxxxxx
13:50 -> 0
=====
Test case #2
01:05 -> 50     xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
06:09 -> 46     xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
10:12 -> 4      xxxxx
13:50 -> 0
=====
Test case #3
01:03 -> 40     xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
04:05 -> 10     xxxxxxxxxx
06:07 -> 35     xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
08:09 -> 12     xxxxxxxxxxxxxxxx
10:11 -> 2      xx
12:50 -> 2      xx
=====
```